stage of organic being." He also declares (p. 425) the belief that "the evolution of organic nature is at the basis of human history is the *unswerving belief* of the present writer."

My present object is not to object to any of these statements, but simply to call attention to the complete accord which exists between the Professor's language and that of realism, or any of the materialists whose sayings he sometimes deprecates, and to note the practical outcome of such teaching as that of his metaphysical "Grammar."

Its Idealism is an Idealism of parade, to be brought out occasionally, above all to confound some rash or inexperienced advocate of Intellectualism and Common-sense. But ordinarily and habitually it most certainly is, as "C. G. K." affirms (NATURE, July 7, p. 222), "distinctly materialistic." This teaching is an excellent example of that "intellectual thimble-rigging"—I use the illustration as an apt one, but in no invidious sense—to which I have elsewhere (see *On Truth*, p. 135) called attention in greater detail.

In conclusion I would ask how Prof. Pearson's metaphysical system can be necessary or even useful for the progress of science?

What does it matter for science, provided we are all agreed about those things whereof the senses can take cognizance, whether or not we are convinced that something extended exists objectively? The Professor affirms (p. 215) that the man of science "refuses to project his conceptions, atom and ether, into the real world of perceptions until he has perceived them there." We are then so far agreed. We both welcome ether units, prime atoms, chemical atoms, molecules, molecular motion, ether rings, ether squirts, &c., as admirably useful working hypotheses, but not as things to be yet regarded as objective realities. If I am right, the utility for science of much of the Grammar is not easily to be recognized. But it has a very distinct metaphysical utility for the opponents of the system Prof. Pearson favours, and will no doubt meet with grateful recognition at the hands of some of them.

ST. GEORGE MIVART.

Hurstcote, July 16.

A "Viper" Bite.

As cases of poisoning from the bite of venomous reptiles are happily rare in this country, it may prove interesting to some of your readers if I relate my experience on this matter.

About a month ago I caught two snakes at Bickleigh, near Plymouth, and whilst examining one it "bit" or rather struck me on the lower part of the right thumb. I immediately sucked the puncture (it could not be called a wound) which bled a little, and tried to make light of the matter. A livid patch soon formed round the point, and the hand and arm commenced to swell. In a quarter of an hour I was unable to hold anything, and almost in a fainting condition. The first symptom (apart from the swelling) was a peculiar taste and a sensation of swelling in the teeth, then the tongue commenced to swell and became so large that I could hardly move it, my eyes seemed ready to start from their sockets.

In half an hour a terrible vomiting commenced, preceded by excruciating pains in the stomach and heart, and continued with the pains altogether for nine hours, every drop of liquid being ejected almost as soon as swallowed; there was also violent purging and complete suppression of urine.

There was practically no pain in the arm; altogether the painful symptoms lasted for about nine hours.

I did not lose consciousness at any time. The arm continued to swell for two days, and then it was nearly as large as my leg. After this the swelling subsided, but the arm did not return to its normal size until twelve days after the accident. After the swelling had gone I suffered very much from rheumatical pains, and in fact do so now, and the digestion was also very much impaired. The viper is a male, a little more than two feet long, and about one inch in diameter at the largest part. Colour, a dull yellowish brown on the upper side, with a zigzag black line running down the whole length. On the under side it is nearly black except at head, where it is pale yellow. I have kept the reptile now for nearly five weeks, and although well supplied with small frogs, &c., it has not eaten anything, and seems as lively as ever.

Cases of this kind, where the sufferer is able to record the symptoms, being rather unusual, is my excuse for occupying the space of NATURE.

Plymouth. W. A. RUDGE.

THE EDINBURGH MEETING OF THE BRITISH ASSOCIATION.

THE Association has already met three times in Edinburgh, in 1834, in 1850, and in 1871. With the success of the 1871 meeting fresh in the memories of many citizens, the Town Council and other public bodies have entered cordially into the local arrangements for the meeting. The local committee formed some twelve months ago and its sub-committees have been actively at work, and everything is now practically ready for the reception of the Association.

The number of members of the Association who have indicated their intention of being present, and of new members who have already joined, are such as to show that the meeting will be an exceptionally large one. More than fifty distinguished foreigners have accepted the invitation of the local committee to attend the meeting.

Reception and Section Rooms.—The reception rooms are in Parliament-square, adjacent to St. Giles' Cathedral and the City Chambers. The Parliament Hall, the various court rooms, the rooms of the Society of Advocates, and the new library and hall of the Solicitors before the Supreme Courts have been placed at the disposal of the committee, and have been so appropriated as to constitute an ideal suite of reception rooms, including secretaries' and treasurer's offices, post, telegraph, and telephone office, ticket office, enquiry office, reading room, writing room, ladies' boudoir, smoke room, and refreshment buffet. Many of the rooms lend themselves to decoration, and the arrangements are as excellent in taste as in convenience. The Section Rooms are all in the University buildings; Sections A, E, F and G in the old buildings, and B, C, D and H in the new buildings. These buildings are about two minutes' walk from one another, and about four from the reception rooms. The section rooms are all well adapted for the purposes of the meetings, and in connection with each there is ample accommodation for committee meetings, while provision has been made for the occasional subdivision of some of the sections. In the new University buildings a room has been set apart for a temporary museum, in which objects of interest, which are brought under the notice of any of the sections, may be afterwards placed so as to be more easily inspected than is possible during the meeting of the section. It is expected that this will prove a valued addition to the convenience of the meeting.

While light refreshments may be had at the buffet in the reception rooms, the principal luncheon room will be found in the Students' Union Club, situated between the new and old University buildings. In the club there will also be a ladies' room, smoking-room, billiard-room, &c.

Lectures and Entertainments.—The programme for the evenings will follow the usual lines:—On Wednesday Sir Archibald Geikie will assume the presidency and deliver an address; on Thursday, the Lord Provost, Magistrates and Town Council invite members and Associates to a *conversazione* in the Museum of Science and Art; the Lord Provost will receive and welcome guests to the City. On Friday, Prof. Milnes Marshall will lecture on "Pedigrees"; on Saturday, Prof. Vernon Boys will lecture to artizans on "The Photography of Flying Bullets"; on Monday, Prof. Ewing will lecture on "Magnetic Induction," and on Tuesday there will be a *conversazione* in the Music Hall on the invitation of the local committee.

Military bands will play in the Princes Street Gardens every afternoon during the meeting, and there will be organ recitals in the "Reid" music class-room. Afternoon entertainments will be given by the Royal Scottish Geographical Society, the Rector and Masters of the Edinburgh Academy, and by others.

Arrangements have also been made to form parties to visit Edinburgh Castle, Holyrood Palace, and Arthur's Seat; these visits will be in the afternoon.

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Excursions.—The committee have prepared a long list of excursions. Among those for Saturday afternoon are geological excursions to North Berwick and Tantallon, and to the Pentland Hills; a botanical excursion to Gullane; a dredging excursion on the Firth of Forth; and excursions to such places of interest as the Land of Scott, the Fairfield Shipbuilding Works and Glasgow, the Pumpherston Oil Works, Dundee and the Firth of Tay, Stirling, Rosslyn, Dalmeny and the Forth Bridge, Newbattle Abbey, and Dalkeith Palace.

On Thursday, occasion is taken to visit places of interest further afield. St. Andrews, Dunkeld, Scone and Murthly (arboricultural), Croy (archæological), Dobbs Linn Moffat (geological), Moorfoot Waterworks, Hamilton Palace, Drumlanrig, Yarrow, Crieff, the Trossachs, Loch Lomond, the Firth of Clyde, are all brought within the limit of a one-day excursion.

Many of the more important manufacturing and other works in the city and neighbourhood are to be open to members, who will thus have ample opportunity of becoming acquainted with the trade of the district. Visits to the paper works at Penicuik or Currie, to the printing-ink works at Granton, and to the gunpowder mills at Roslin, will form pleasant short afternoon excursions. The printing offices of Edinburgh are of great interest, and many of them have made arrangements for the reception of visitors. Breweries, distilleries, biscuit factories, and hydraulic engineering works have all their special developments here, and are well worthy of visits.

Hospitality and Lodgings.—Perhaps the greatest difficulty that the local committee has had to face has been the date fixed for the visit of the Association. August is *the* holiday month in Edinburgh, and under ordinary circumstances the residential parts of the town are during that month entirely in the hands of the police. For many of the citizens, indeed, holidays are possible only in August. It has therefore been matter of congratulation to the committee dealing with this part of the work to find that many people intend to remain in town during the meeting of the Association and that they have been informed of a large number of offers of hospitality having been sent to visitors.

The hotel accommodation in Edinburgh is considerable, but the strain upon it in August is great. The local committee have secured for members of the Association a considerable number of rooms in hotels, and these are being rapidly allotted on application. Visitors who intend to live in hotels during the meeting will do well to make their arrangements early.

With regard to lodgings, probably no town is so well off as Edinburgh, and fortunately during August many of the best rooms are vacant. A register of lodgings has been opened at the local offices, and the secretaries are prepared to give assistance to visitors desiring to secure apartments. A provisional list of hotels and lodgings has been prepared and may be had on application. The principal clubs have offered to admit visiting members of the Association as honorary members during the meeting, subject to such conditions as are required by the constitution of the club.

Publications.—The programme of local arrangements will contain a hotel map of Edinburgh, a large scale map of central Edinburgh, including all the buildings used in connection with the meeting of the Association, and a general map of Edinburgh and Leith, on which all the works open to visitors are specially marked.

The "Excursions Handbook," published by the committee, gives details of the various transit arrangements and general sketches of the routes to be taken. It also indicates the nature of the interest attached to each excursion. The handbook will be illustrated by a special map of the South of Scotland and by section maps on a larger scale showing details of excursions.

F. GRANT OGILVIE.

THE ORIGIN OF LAND ANIMALS: A BIOLOGICAL RESEARCH.[1]

THIS remarkable and very unequal work, many-sided and heterogeneous, is worthy of careful consideration. It is not wanting in imagination, more or less disciplined, and it is loaded with information from the works of contemporary naturalists, now for the first time brought together in a single volume. One great merit it has of regarding plants and animals, not merely as forms of life, but as living forms: the machinery is exhibited to us in motion.

The title of the work scarcely conveys an adequate idea of its comprehensiveness; it might just as well have been styled "The Evolution of the Living World [for plants are not excluded from its universal purview], and the way it has been brought about."

The leading idea appears to be that a change from marine to terrestrial habitat has taken place much earlier in the history of the higher forms of life than is generally supposed, that the land from the early beginnings of geologic time has been peopled both with animals and plants, and has, more than the sea, been the great arena of progressive change. At the outset, the shore, where sea and land and air all meet and commingle, was the birthplace of life, and from it living forms have continually wandered in all directions—to the open ocean and the abyssal depths, to rivers, marshes, and dry land. From the Algæ, which are almost the only marine plants, the vegetable kingdom was derived. That this is characteristically terrestrial is due to the fact that vegetable protoplasm is less adaptive than animal. "Plants as land proprietors are the true conservatives;" hence, once on land always on land. The terrestrial character of plants offers a suggestive hint as to the place of development of the greater part of the animal kingdom: it also has been on land, but with more numerous offshoots to the sea. In terrestrial plants such as Myxomycetes—"the true Bathybius"—are the roots of the animal world; or if this claim be not admitted, and to Bacteria be assigned this place, a terrestrial origin remains unimpugned, since these organisms are predominantly inhabitants of the land.

The migration of marine animals may be direct, but more usually it is by successive stages, first through fresh water—"the great highway to land-life"—then to damp places, and finally to the dry land itself, which, however, at the time of migration may have been subjected to a damper and warmer climate than at present prevails. With change of medium progressive modification has been associated, for existence in the air makes three great demands on the organism, it must protect itself against being dried up, acquire new modes of respiration, and more substantial organs of support.

Many animals, ennobled by their response to these demands, have returned to the sea, and exercise dominion over it, undergoing, of course, fresh modifications, particularly of the respiratory organs; while others have retained possession of the terrestrial domain, adapting themselves to minor changes of habitat and climate. Thus far more groups of land-animals are derived from a terrestrial ancestry than we imagine, and the next-of-kin of orders now characteristically marine are less frequently than we suppose to be found in the sea, but must be sought for on the land. The whale and sea-turtle, land crabs and climbing fish, so far from being rare and exceptional cases, are instructive examples of great migratory movements and associated anatomical change.

The hypothesis not only supplies a needed stimulus, powerful enough to account for the evolution of the organic world, but at the same time it explains the futility of our search in marine strata for connecting links between lead-

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[1] "Die Entstehung der Landtiere: ein Biologischer Versuch." Von Dr. Heinrich Simroth, Privat-docent an der Universität, Leipzig. Pp. 492, with 254 Illustrations in the Text. (1891.)

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